ATTACHMENT 19

to Operations/Human Performance Group Chairman's Factual Report

Operating Procedures

(Pilot Flying and Monitoring Duties)

DCA10IA001

General

Introduction

Every airline must develop a fundamental philosophy that supports its operating requirements. This philosophy evolves over time due to an airline's route structure, types of aircraft, management policies, and other related factors.

Many years ago Northwest Airlines developed an operating philosophy under which individual pilot tasks were organized into a time-ordered flow of events. The objective of this method of organization was a smooth, coordinated flight deck management system which promoted standardization and enhanced safety.

Under the Northwest system each crewmember is assigned specific duties. However, an organized and standardized method of integrating these duties with the other pilot is also needed. Standard Operating Procedures - Amplified (SOPA) is established for this purpose. SOPA is not intended to supply detailed systems or component operating information, but primarily:

to establish the sequence in which the designated steps are accomplished and

to designate which crewmember normally accomplishes each step.

SOPA is a procedural guide to the proper conduct of a **normal** flight. Emergency, Abnormal, and Supplemental procedures are not included in SOPA. Proper use of SOPA requires a thorough knowledge of the aircraft, its systems, and company policies. Where a detailed explanation of a given step or policy is required, that detail will be found in other parts of the Aircraft Operating Manual (AOM), the Cockpit Operating Manual (COM), or the Flight Operations Manual (FOM).

TEAMWORK is the key concept to an understanding of SOPA. As a pilot you are an integral part of a coordinated operation. SOPA explains not only YOUR duties but also the duties of the OTHER pilot.

Knowing what to expect from the other pilot aids in standardization and is an important factor in crew resource management. This knowledge enables you, the crew member, to detect and correct errors or omissions.

Adherence

All pilots will follow SOPA during **normal** operations.

The Captain has the authority to deviate from SOPA, but only when unusual circumstances require him or her to do so in the interest of safety.

Structure

SOPA defines normal phases of flight (before start, pushback/start, engine start, etc.) and describes procedures that will accomplish required tasks prior to verification with checklists.

SOPA is organized as a chronological flow, with pilot duties appearing in vertical columns, one column for each crew member. Interaction between crew members is clearly indicated.

All duties are normally performed in the order in which they appear in SOPA. However, that does not preclude the earlier or later performance of isolated items that are not "on command" items or part of a specific flow pattern. In other words, the time ordered nature of SOPA outlines what may be considered a normal flight, but aside from flows and "on command" items, it allows some flexibility in the order of performance to allow

for specific circumstances. For example, in flight, the flaps will never be set until the Pilot Flying (PF) calls for them, but the departure briefing can be performed whenever a convenient opportunity arises prior to accomplishing the Before Start checklist.

It must be understood that while there are many duties (like crew briefings) that may be performed equally well at a number of acceptable times, only one of those times could be chosen for the appearance of the item in SOPA. The time chosen was the most common time for the completion of the item."

It must be understood that while there are many duties (like crew briefings) that may be performed equally well at a number of acceptable times, only one of those times could be chosen for the item's appearance in SOPA. The time chosen was the most common time for the completion of the item.

Flow Patterns

Where the duties performed by a crew member involve a sequential series of steps designed to accomplish a specific task (e.g., starting the engines), that series of steps is called a "flow pattern."

Flow patterns are established to configure aircraft systems in an organized manner. Unless otherwise indicated, crew members are expected to accomplish the required tasks from memory. The checklist is used after the flow pattern is completed.

Checklists are the means for cross-checking that critical tasks have been accomplished. The Northwest philosophy is "DO, then VERIFY."

Checklists and "On Command" Items

"On command" items (e.g., calling for a checklist or configuration change) are designated by a solid diamond (◆). Tasks that are performed in response to the command are designated by an open diamond (◇).

"On command" items are important to SOPA in that they specify required crew interaction. They also encourage positive habit patterns.

Checklists and "on command" items will **not** be accomplished until called for. If a checklist or "on command" item is not called for at the appropriate time, the pilot who will read the checklist or accomplish the item shall remind the other pilot of the omission.

Accomplish each checklist segment after completion of the appropriate flow pattern. The Captain (on the ground) or the PF (airborne) will call for the checklist at the appropriate time.

If an item can affect flight safety IN A DIRECT WAY, it is considered for inclusion in the checklist. Other items that do not directly affect the safe handling of the aircraft appear in SOPA but not on the checklist. In other words, while everything on the checklist is in SOPA, not everything in SOPA is (or should be) on the checklist.

Flow patterns are designed to follow a convenient, logical pattern through the flight deck. The order of the checklist will normally follow the same flow established by the preflight flow. Therefore, the checklist steps will not necessarily follow the same order as the flow pattern.

Prerequisites

SOPA begins with arrival of the first flight deck crew member at the aircraft.

The Captain will normally accomplish flight planning tasks. The First Officer or relief pilot will normally accomplish the exterior preflight. The Captain may ask the First

Officer to coordinate with Flight Dispatch, Maintenance, or to assist with flight planning in the interest of an on-time departure. See the FOM for augmented crew policies.

Before each flight, both pilots shall familiarize themselves with the aircraft logbooks, ensuring that no open logbook write-ups remain. Additionally, they will review the weather, route of flight, dispatch release, NOTAMS, field reports, Flight Information File (FIF) messages, applicable Jeppesen pages, and other matters related to the flight.

Communications

Both pilots will monitor the receipt of the initial ATC clearance. The clearance altitude (in the ALT window) and the transponder code will be set by the pilot requesting the clearance and verified by the other pilot.

Use VHF-1 for all ATC communications with Ramp (when related to aircraft movement), Ground, Tower, Departure, En Route ATC, and Approach. Use VHF-2 for ATIS, clearances, company communications, remote de-icing and for monitoring GUARD (monitor GUARD when not using the radio for other purposes). VHF-3 is normally dedicated to ACARS. Routes requiring an HF radio, can only be flown using an HF equipped aircraft.

The Captain will always accomplish Interphone communications between the flight deck and the pushback coordinator.

Use ACARS for company communications when possible. DO NOT transmit, examine, or compose ACARS messages during critical phases of flight.

Pilots leaving the ATC frequency must inform the other pilot of his/her intentions. Be especially alert during busy ground operations or during the departure or approach phase.

Use of the FCU

The FMA and/or the PFD display must be verified any time an autopilot and/or flight director is in use and a flight mode change occurs.

Autopilot engaged:

The Pilot Flying (PF) will operate the FCU functions such as speed, heading, altitude and approach pbs in response to an ATC clearance or as desired in the case of speed.

Autopilot not engaged:

The Pilot Monitoring (PM) will operate the FCU functions in response to an ATC clearance or the PF's command.

When engaging or disengaging the autopilot/autothrust, the PF will ensure that the PM is aware of the autopilot/autothrust status.

When selecting or deselecting the flight directors, both flight directors must be selected ON or both must be selected OFF.

Exceptions to these principles may be made during high workload periods. An example is during an automatic missed approach when the PF may verbally request the PM to make inputs to the FCU, thereby facilitating better flight management.

Altitude Awareness

Both pilots will be aware of and agree on altitude assignments. If either pilot is unsure of the assigned altitude, the crew will immediately query the controlling agency for

clarification.

The PM will normally acknowledge the cleared altitude with the control facility by repeating the altitude assignment complete with the aircraft callsign. However, this acknowledgment may be made by either pilot.

After setting the altitude in the FCU window, the pilot will point to the target altitude on the PFD and state the altitude. The other pilot will then point to the target altitude on the PFD and repeat the altitude (e.g., "350").

All secondary duties should be suspended when within one-thousand feet of a level off (climb and descent).

Runway Incursion Prevention

During taxi operations both pilots must be aware of runway crossing clearances. The FO will normally acknowledge the taxi clearance, except during landing rollout when the PM will answer.

Do not accept complex taxi clearances during landing rollout. Answer "standby", and request the taxi clearance once clear of the active runway.

If either pilot is unsure of any runway crossing clearance, was distracted by other flight deck duties, or otherwise did not hear the radio transmission containing the runway crossing clearance, the crew will query the controlling agency before proceeding beyond the hold short line.

Operating the FMS

Normally, the PM makes all MCDU inputs during flight. For those inputs that have an immediate affect, the PM shall verify the input with the PF prior to inserting.

The PF may make inputs, conditions permitting, if the PM is occupied with other duties.

Programming the MCDU during high workload phases of flight should be kept to a minimum. Whenever possible, program descent and approach data while still in cruise.

Conduct of the Flight

The primary duty of the pilot flying or taxiing is to concentrate on that activity. The PM will perform secondary tasks such as communications, performance data review, and systems operations to prevent distractions for the PF.

The PF will call for flap and gear extension and retraction. The PM will respond by placing the lever in the requested position. Visual signals will not be used to initiate gear or flap extension or retraction.

The PM should always verify that the requested flap setting is reasonable and appropriate for the phase of flight and speed/weight combination.

If operational necessity requires an immediate configuration change and the PM is occupied with other duties, the PF may announce the change and move the appropriate control. This should be understood as the exception and not the rule.

The most important function of the PM is to serve as a backup to the PF and to identify operational errors when they occur. During periods of high workload, it is essential that the PM prioritize tasks effectively in order to be available to the PF. **The PM should not be accomplishing a secondary task when a primary task is occurring.**

Examples of primary tasks include ensuring that the aircraft levels at the assigned altitude, making appropriate altitude awareness callouts, verifying that the aircraft

follows the assigned routing outbound after crossing a fix, receiving and acknowledging ATC clearances/instructions, and accomplishing required flows, checklists, etc.

Secondary tasks include ACARS messaging, flight plan and fuel recording, TP plotting, PA announcements, ECM reports, company calls, logbook entries, flight attendants communications (except for emergencies), looking up information in flight manuals, etc.

Both pilots are expected to back up one another in important tasks such as checklist completion, monitoring ATC, altitude clearances, decision height determination, etc. Both pilots will be aware of assigned altitudes.

SOPA is very specific about when tasks are to be accomplished. The practice of trying to "get tasks out of the way as rapidly as possible" instead of prioritizing them helps the PM stay ahead of the aircraft, but can actually be detrimental to safety in some situations. Performing a secondary task when the aircraft is about to level off or change course is such a situation.

Caution: *Special attention should be given to backing up navigation procedures. Nearly 100% of off course navigation errors are attributed to failure to follow established procedures. Don't be lulled into complacency by the reliability of the navigation system. Many crew inputs to the system are required and the need for pilots to back up each other cannot be over emphasized.*

Each pilot must always be aware of the flight deck environment. While working through abnormal procedures and during periods of high workload, pilots should be even more alert to distractions and the issue of task prioritization. When any pilot notes a distraction by secondary stimuli, it must be verbally noted so they can re-focus on the primary task.

Warning System

On the ground, the First Officer resets the Master Caution light when it illuminates due to any routine operation such as engine shut down, APU operation, etc.

If the Master Caution/Warning light illuminates for a non-routine situation, the first crewmember recognizing the malfunction will announce it clearly and distinctly (e.g., "engine number one oil pressure low"). After both pilots observe the condition that caused the system to illuminate, the PM will reset the Master Caution/Warning lights.

Use of the ECAM

Use the ECAM system to stabilize abnormal/emergency situations that are encountered. During normal operations, keep the ECAM in its "normal" configuration. This means keeping the ECAM clear of STATUS pages, etc.

The EMER CANC pb on the ECAM control panel may be used to eliminate warnings associated with known maintenance discrepancies that are listed in the aircraft logbook. It may also be used in flight to eliminate recurring spurious faults (e.g., RECORDER DFDR FAULT). Use of the EMER CANC pb to cancel warnings meant to alert the aircrew, such as autopilot or autothrust disconnect warnings, is prohibited.

Headphone and Flight Deck Speaker Use

In the aircraft, headphones or boom microphones/headsets are required to be worn during operations below 18,000 feet, and are normally worn until the top of climb and from the start of descent throughout approach and landing. During cruise, flight deck speakers may be used. Speaker volume should be kept at the minimum usable level adequate to avoid interference with normal crew flight deck conversation, but still ensure reception of relevant communications.

Crew Duties

Note: Delta publishes Crew Duties tables in Volume 1, NP-10 section. NWA outlines all crew duties in the SOPA/SMAC chapters. During the transition period from the NWA manual format to the New Delta format, The Crew Duties tables will be published in this section with the Delta look & feel while still being presented in SOPA/SMAC in the familiar NWA format.

Crew Duties Reference Chart

The crew Duties Reference Chart below indicates normal divisions in pilot work load. This chart serves as a guide to help crewmembers coordinate their duties with regard to a typical flight.

The chart delineates areas in which a crewmember must remain reasonably proficient if crew coordination is to be maintained at an optimum level.

When operating with an additional First Officer, the Captain will designate one of the First Officers to perform Relief Pilot (RP) duties.

When operating without an additional First Officer, the F or PM will perform the duties listed for the RP. These are indicated by a bullet in parentheses (•). Special situations or unusual occurrences may require some deviations from the charted duties; the Captain ultimately makes that determination.

Crew Duties Reference Chart Legend
C - Captain, **F** - First Officer, **RP** - Relief pilot, **PF** - Pilot Flying, **PM** - Pilot Monitoring
When an AR (Augmented Relief Captain) is a crewmember, their duty station is on the flight deck, unless a higher priority jumpseat rider is operationally required, e.g., FAA, Line Check Airman, etc.
Items not shaded are required every flight.
Shaded rows are for Class II navigation only.
(N) Class II navigation duties required if operating in WATRS or Class II airspace for one hour or less.
(•) = When no relief pilot is on board, the FO or PM will perform these duties.

FLIGHT PLANNING					
Crew Duties	**C**	**F**	**RP**	**PF**	**PM**
Sign - in	•	•	•		
Confirm license, medical, ID, FCC license, passport, & visas (if req) are in possession & current	•				
Brief F/O & RP.	•				
Create flight folder contents.	•				
Review flight plan: routing, remarks & alternates.				•	•
Review & brief weather information, departure, destination, enroute, alternates, NOTAMS, turbulence & winds charts (as appropriate)	•	(•)	•		
Verify Flight Plan - check routing	•	•			
Prepare oceanic orientation chart (if required).				•	
Verify oceanic orientation chart (PM reads waypoints from chart to PF to check) (if required).				•	•
Ensure flight folder delivered to aircraft (if required).				•	•

FLIGHT DECK PREPARATION					
Crew Duties	**C**	**F**	**RP**	**PF**	**PM**
Brief Flight Attendants.	•				
Check aircraft logbook.	•	(•)	•		
Flight Deck Inspection.					•
Exterior Inspection.		(•)	•		
Preflight Procedure				•	•
Complete exterior inspection & interior preflight; confirm water and lavatories are serviced. Complete Crew Rest Compartment pre-flight (as installed).		(•)	•		

FLIGHT DECK PREPARATION					
Crew Duties	**C**	**F**	**RP**	**PF**	**PM**
ACARS data/clocks UTC.	•	•			
Altimeter RVSM check.	•	•			
Initialize & align IRUs.				•	
Verify correct position initialization.					•
Departure ATIS.		(•)	•		
Load routing, performance, winds & climb profile into FMS.				•	
Verify loading of FMS. If off airways, check and circle full lat/long coordinates of Class II waypoints and fixes leading to Class II waypoints.					•
(N) Perform HF System Test (if required). Caution: Do not transmit on HF while fueling.		(•)	•		
Receive security briefing.	•				
Check final documents on board.	•				
ACARS/Radio closeout (if required)		(•)	•		
Ensure minimum fuel for pushback	•	(•)	•		
Departure briefing.				•	

TAXI AND BEFORE TAKEOFF					
Crew Duties	**C**	**F**	**RP**	**PF**	**PM**
Taxi clearance.		•			
Takeoff briefing.				•	
Review transition altitude.			•	•	•
Check aircraft position relative to takeoff runway on ND.			•	•	•
Ensure minimum fuel for takeoff.	•	(•)	•		

CLIMB/CRUISE (Above 10,000 feet)					
Crew Duties	**C**	**F**	**RP**	**PF**	**PM**
Send company reports (if required in cruise).					•
Complete enroute items (ETAs, Fuel, etc.) on the flight plan.			•		(•)
At TOC - RVSM check.					•
PA announcements.			•		(•)
Monitor enroute fuel temperatures.			•	•	•

PRIOR TO ENTRY INTO CLASS II AIRSPACE					
Crew Duties	**C**	**F**	**RP**	**PF**	**PM**
Referencing the oceanic clearance, read all oceanic clearance waypoints, altitude, and cruise Mach to PF.					•
Confirm FMS is correctly loaded.				•	
Draw first diagonal across all circled waypoints.					•
(N) Perform Navigation Accuracy Check.					•

TRACK ENTRY/CLASS II AIRSPACE					
Crew Duties	**C**	**F**	**RP**	**PF**	**PM**
(N) Perform HF SELCAL check.					•
Set cruise Mach and set required RNP for theater of operation.				•	
Check autoflight system.				•	
Set VHF radios.					•
Set transponder code.					•
Select strategic lateral offset (0, 1, 2 nm right).				•	•

APPROACHING EACH TRACK WAYPOINT (Class II Off airways)					
Crew Duties	**C**	**F**	**RP**	**PF**	**PM**
Off airways, PF referencing the FMS reads the name or FMS identifier of the active waypoint and the next 2 waypoints.				•	
Off airways, PM referencing the flight plan verifies the name or FMS identifier of the active waypoint and the next 2 waypoints.					•

WAYPOINT PASSAGE (Class I or On Airways)					
Crew Duties	**C**	**F**	**RP**	**PF**	**PM**
Verify NAV engaged.					•
Record time, fuel, etc. on HOWGOZIT log.				•	
Make ATC and/or Company position report, if required.				•	•
Place check mark next to waypoint where Company position report was made.					•

WAYPOINT PASSAGE (Class II Off Airways)					
Crew Duties	**C**	**F**	**RP**	**PF**	**PM**
Verify NAV engaged.					•
Draw second diagonal across overflown waypoint.				•	
Confirm primary altimeters are within RVSM tolerance.				•	•

WAYPOINT PASSAGE (Class II Off Airways)					
Crew Duties	C	F	RP	PF	PM
Record AIREP data, and make position report (HF or CPDLC) - include WX (if required).					•
Complete HOWGOZIT log.					•
Send ACARS position report.					•

POST POSITION (approximately 10 minutes) (Class II Off Airways)					
Crew Duties	C	F	RP	PF	PM
Verify NAV engaged.					•
Verify the aircraft is tracking to next active waypoint.					•

TRACK EXIT / Re-Entering Class I Airspace					
Crew Duties	C	F	RP	PF	PM
Set radio/transponder.					•
Confirm ATC clearance (if required).				•	•
Request altitude and desired cruise Mach speed from ATC.				•	•
Confirm strategic lateral offset is zero.				•	•
Set ECON speed; (if applicable) check oceanic RNP deleted.				•	

PRIOR TO TOP OF DESCENT					
Crew Duties	C	F	RP	PF	PM
Obtain arrival ATIS.			•		(•)
Check transition level, approach briefing.			•	•	•
Send ACARS/In-Range report.			•		(•)

AFTER LANDING					
Crew Duties	C	F	RP	PF	PM
Ground control communications.	•	•			
Ramp control communications.		(•)	•		

SHUTDOWN / POSTFLIGHT					
Crew Duties	C	F	RP	PF	PM
Complete ACARS arrival message.		•			
Log book entries.	•				
Confirm flight folder contents.		(•)	•		